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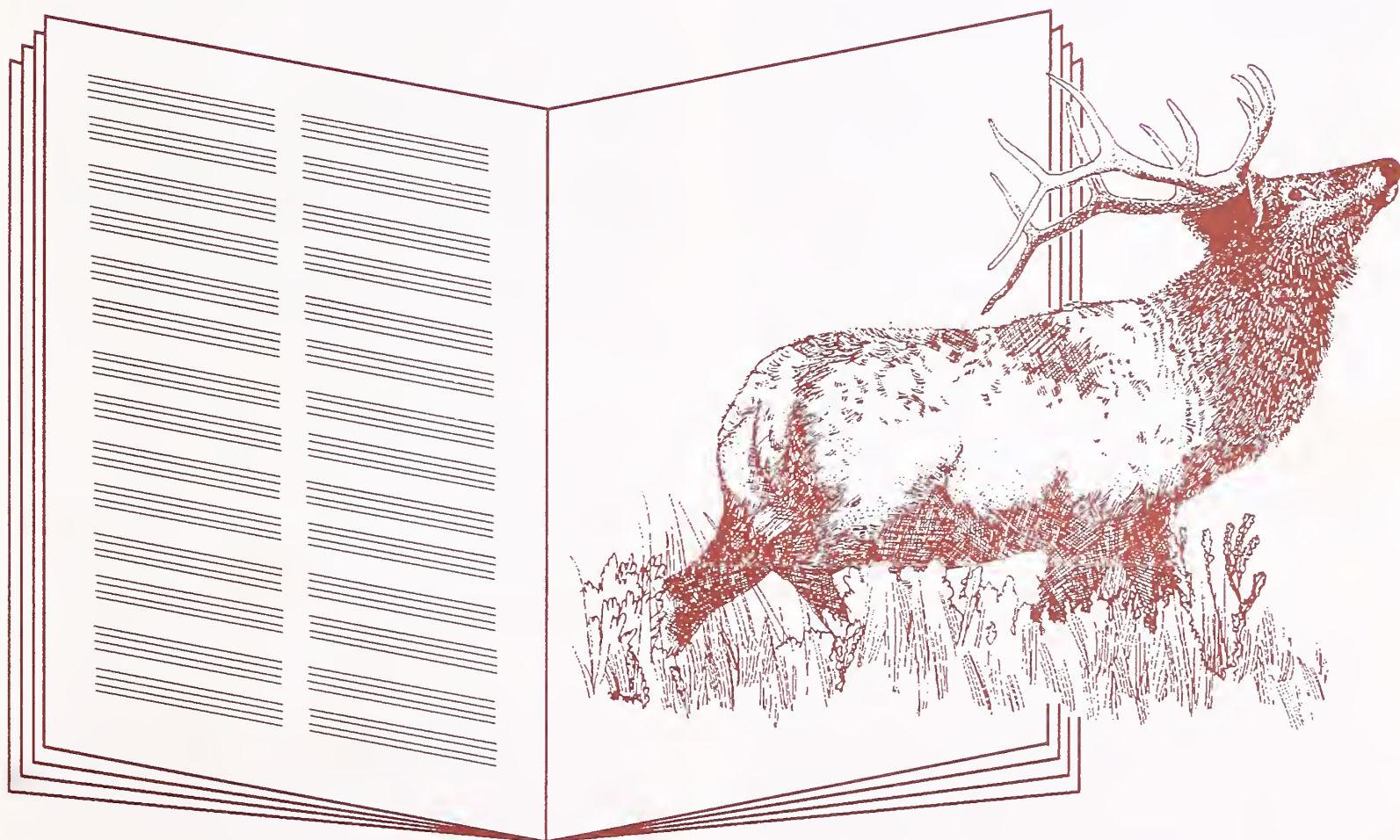
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A Partial Glossary of Elk Management Terms

L. Jack Lyon
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RESEARCH SUMMARY

Elk habitat management guidelines have been incorporated into forest plans throughout North American elk range. These guidelines were developed from research on the influences of timber sales and roads during the summer months. Use of these guidelines has too often resulted in inappropriate extrapolation of available information to applications on winter range, hunting seasons, and other conditions outside the scope of the original research.

As a result of extrapolation, some commonly used terms have taken on several meanings, unusual

analysis procedures have been developed, and some completely new terminology has been created. There have been applications that are confusing to managers and the public alike. It is essential that the terminology of elk habitat management be clarified.

This paper presents the results of an "Elk Management Terminology Workshop" held at the University of Montana's Lubrecht Experimental Forest on April 3 and 4, 1990. Biologists representing State and Federal governments, universities, and private management concerns participated in a facilitated workshop to identify the most commonly misused terms in elk management guidelines and develop consensus definitions.

ACKNOWLEDGMENTS

We are deeply indebted to the many biologists who helped to organize and complete this project. This paper was originally presented at the Western States and Provinces Elk Workshop in Eureka, CA, May 15-17, 1990. It appears in the proceedings of that workshop, but is being revised and reprinted to obtain wider circulation in the Rocky Mountain West.

A Partial Glossary of Elk Management Terms

L. Jack Lyon
Alan G. Christensen

INTRODUCTION

Over the past decade we have witnessed the development and proliferation of elk habitat management guidelines throughout North American elk range. These guidelines were primarily developed from research on the influences of timber sales and roads on elk behavior and summer/fall habitat use. However, the development of forest plans and environmental evaluations have too often resulted in inappropriate extrapolation of available information to applications on winter range, hunting seasons, and other conditions outside the scope of the original research.

In the course of this extrapolation, some commonly used terms have taken on several meanings, unusual analysis procedures have appeared, and some completely new terminology has been created. Some applications have been confusing to managers and the public alike. The future of elk management depends on clear communication among agency personnel and the public. We believe it is essential that the terminology of elk habitat management be clarified and standardized.

This paper presents the results of an "Elk Management Terminology Workshop" held at the University of Montana's Lubrecht Experimental Forest on April 3 and 4, 1990. Biologists representing State and Federal governments, universities, and private management concerns participated in a facilitated workshop to identify the most commonly misused terms in elk management guidelines and develop consensus definitions.

Neither the workshop nor this paper could be comprehensive. Most common terminology in elk management is easily understood and used correctly. The recommended definitions for some terms that have often been misinterpreted or used in ways that suggest two or more meanings are presented here. Workshop participants identified some terms that have been so misused as to become virtually meaningless. We recognize that everyone will not agree with our assessments. We expect misuse will continue.

Maybe the best we can hope for is to take a step toward making it possible for professionals to communicate with each other.

SELECTION OF TERMS

The Elk Management Terminology Workshop emerged from discussions among eight to 10 concerned biologists in Montana and northern Idaho. An initial list of terms to be discussed was generated by this group. This list was circulated to State and Federal biologists and managers actively involved in elk management and the application of elk management guidelines. Participants were asked to indicate the most troublesome terms on the list and write in additional terms if needed. Based on the responses, about 30 respondents were invited to a formal workshop on the terminology of elk management.

We selected 44 commonly used elk management terms for further study. Each term was sent to at least one prospective workshop participant. Some were sent to as many as three participants. Each participant was asked to determine the history and origin of the assigned terms, to note when they were first used in the literature, and to recommend an acceptable definition. Returns from this second mailing were particularly edifying when some participants supplied their own definitions without recourse to the literature.

At the beginning of the workshop, all recommended definitions were distributed to participants. We determined that about a third of the terms are the source of most of the confusion and misuse. Another third have perfectly acceptable definitions and are rarely misused. Troublesome terms were often interconnected so that misuse of one resulted in confusion and misuse of several others. Finally, we discovered that troublesome terms often had a good definition for either structure or function, but not both. If one definition is missing, for instance, function, the term is likely to be misused or misinterpreted, or both.

Participants were split into three workshop groups. All three groups discussed the highly controversial terms. Less difficult terms were handled by only one group. At the conclusion of the workshop, participants recommended development of a new term:

ACCESSIBILITY INDEX: This term will become an essential component of future management for elk security during the hunting season. It is needed to summarize the degree of human access facilitated by such components as roads, trails and their management, terrain and vegetation, season length, and legal restrictions. No specific definition is proposed at this time, but we recommend that research in this area recognize the need for broad applicability.

WORD LIST

BEDDING AREA	HERD HOME RANGE
BULL AGE DIVERSITY	HIDING COVER
CALVING AREAS	HUNTER OPPORTUNITY
CARRYING CAPACITY	KEY COMPONENTS
COVER FORAGE RATIOS	MIGRATION CORRIDOR
CRITICAL HABITAT	NURSERY AREAS
CUMULATIVE EFFECTS	OBJECTIVES
ELK EFFECTIVE COVER	OPEN ROAD EQUIVALENTS
ELK EVALUATION/ ANALYSIS AREAS	OPEN VEGETATION
ELK HABITAT POTENTIAL	OPTIMAL COVER
ELK MANAGEMENT UNIT	POPULATION/HABITAT UNIT
ELK USE POTENTIAL	POTENTIAL ELK USE
ELK VULNERABILITY	ROAD INFLUENCE
ESCAPE COVER	SECURITY
ESCAPEMENT	SECURITY AREA
FORAGE AREA	SECURITY COVER
FORESTED FORAGE	SECURITY HABITAT
GAME MANAGEMENT UNIT	SIGHT DISTANCE
HABITAT ANALYSIS UNIT	THERMAL COVER
HABITAT CAPABILITY	TRANSITIONAL RANGE
HABITAT EFFECTIVENESS	TRANSITORY RANGE
HABITAT USE POTENTIAL	WINTER RANGE

GLOSSARY

Terms evaluated in the workshop discussions are presented here in alphabetical order, and interrelated terms are cross referenced. Those terms rarely misused are not discussed. Words in all capital letters are defined elsewhere in the glossary.

BEDDING AREA: A specific site selected by big game animals to lie down and rest. See OBJECTIVES.

BULL AGE DIVERSITY: An attribute of population age structure providing a relative measure of the distribution of bull elk among age classes in a population. See OBJECTIVES.

CALVING AREAS: Any areas between WINTER RANGE and summer range where cows give birth to calves.

Discussion: This may be a specific area where a majority of calving for a herd takes place. It may also be scattered locations throughout the HERD HOME RANGE. See OBJECTIVES.

CARRYING CAPACITY: Maximum rate of animal stocking without damaging vegetation or related resources.

Discussion: This is a well-established biological concept, but it is too imprecise for any useful application in elk management terminology.

Recommendation: Avoid using this term in relation to elk.

COVER FORAGE RATIOS: The percentage of a HABITAT ANALYSIS UNIT in cover condition, and the percentage in forage condition, expressed as a ratio totaling 100.

Discussion: COVER:FORAGE has had general application and can be useful in discussing the diversity of summer elk habitat. Application of the term is usually related to habitat models and habitat analysis, but COVER:FORAGE is not an evaluation of overall habitat quality. It should be recognized that COVER:FORAGE contains no inherent provision of SECURITY.

Recommendation: Use of the term should be limited to applicable situations described in the literature.

CRITICAL HABITAT: A term preempted by the Endangered Species Act of 1973 and considered inappropriate in elk management since then.

Recommendation: Do not use this term when KEY COMPONENT is intended.

CUMULATIVE EFFECTS: The additive impacts when a number of unrelated, or related but discrete, management activities take place in a given area.

Discussion: Multiple impacts on wildlife populations of simultaneous but not necessarily coordinated human activities have been recognized as extremely difficult to measure and express. Commonly included are past, present, and reasonably foreseeable future activities. We will need technologies for considering multiple effects as the implications of hunting season SECURITY become more apparent.

ELK EFFECTIVE COVER: As used in several forest plans, this term appears to be equivalent to HABITAT EFFECTIVENESS, but it includes implications of both habitat productivity and SECURITY.

Discussion: Because of the way it is used, the term appears to provide habitat information that does not, in fact, exist.

Recommendation: This term should only be used on those forests where it appears in the forest plan. Every effort should be made to clarify the usage so as not to include SECURITY or productivity.

ELK EVALUATION/ANALYSIS AREAS: See HABITAT ANALYSIS UNIT.

ELK HABITAT POTENTIAL: Cannot be defined, although it has been used as a synonym for CARRYING CAPACITY, for HABITAT CAPABILITY, and for ELK USE POTENTIAL.

Discussion: This appears to be a term that tries to find some middle ground between elk use and CARRYING CAPACITY. As a result, the term also confuses accepted definitions of HABITAT EFFECTIVENESS. See ELK USE POTENTIAL for further discussion.

Recommendation: Do not use this term.

ELK MANAGEMENT UNIT: An administrative unit established by the Montana Department of Fish, Wildlife and Parks. See HABITAT ANALYSIS UNIT.

Discussion: Other States probably use other terms.

Recommendation: This term should not be used in reference to habitat analysis.

ELK USE POTENTIAL: A scaled representation of maximum possible use by elk.

Discussion: ELK USE POTENTIAL is the standard against which HABITAT EFFECTIVENESS is normally calculated. It is not, however, an acceptable expression of HABITAT CAPABILITY or CARRYING CAPACITY. Other terms cross-referenced to ELK USE POTENTIAL include ELK HABITAT POTENTIAL, POTENTIAL ELK USE, HABITAT USE POTENTIAL, and HABITAT CAPABILITY. All of these terms strive to identify the ability of a habitat to support elk. However, they are almost always used in a context that compares current with predicted elk use in relation to changes in vegetation. The terms based on “use” appear in the literature related to habitat models. They are probably valid synonyms.

Recommendation: These terms should be used only as justified by the existing literature. They should not be considered random synonyms, and under no circumstances should they be considered equivalent to either CARRYING CAPACITY or HABITAT EFFECTIVENESS.

ELK VULNERABILITY: A measure of elk susceptibility to being killed during the hunting season. This is the antonym of SECURITY during the hunting season.

Discussion: This is primarily a functional concept that is the sum of many factors such as SECURITY, HUNTER OPPORTUNITY, hunter behavior, and elk behavior. It has often been defined in ways related to ESCAPEMENT of branch-antlered bulls.

Recommendation: This term represents a complex area in which a great deal of research remains to be done.

ESCAPE COVER: Vegetation dense enough to aid animals in escaping from potential enemies.

Discussion: Although this is one of the oldest terms in game management, workshop participants considered it too imprecise for use in elk management. It appears as a synonym for SECURITY, SECURITY AREA, SECURITY COVER, and HIDING COVER, but fails to convey any satisfactory meaning.

Recommendation: Do not use this term.

ESCAPEMENT: The number, or proportion, of elk surviving the hunting season. Frequently the emphasis is on specific age and sex classes of elk.

Discussion: In common usage there is confusion with ESCAPE COVER and with the act of escaping. Fisheries literature is clear and useful, indicating that this term can be used to describe the number of animals surviving.

FORAGE AREA: In habitat evaluation models, the percentage of a HABITAT ANALYSIS UNIT not considered HIDING COVER or THERMAL COVER.

Discussion: The workshop agreed that this term will be used correctly in most instances. However, some elk habitat models define FORAGE AREA as openings, which confuses the status of forage found within timber stands. See FORESTED FORAGE.

FORESTED FORAGE: Sometimes used in habitat evaluation models to describe FORAGE AREA within forest stands that are neither HIDING COVER nor THERMAL COVER.

Discussion: Although intended to be a solution, FORESTED FORAGE has become an additional problem. One workshop group noted that because valuable forage is often found in defined cover areas, the term might be interpreted to include all of COVER:FORAGE.

Recommendation: If used at all, this term should be carefully and specifically defined by the user.

GAME MANAGEMENT UNIT: An administrative unit established by the Idaho Fish and Game Department. See HABITAT ANALYSIS UNIT.

Discussion: Other States probably use other terms.

Recommendation: This term should not be used in reference to habitat analysis.

HABITAT ANALYSIS UNIT: An area of land selected as the unit for evaluating the quality of elk habitat.

Discussion: This term and ELK EVALUATION/ANALYSIS AREAS had identical definitions and seem to be used

interchangeably. The areas are commonly defined by geographic or administrative boundaries.

Recommendation: The workshop achieved no consensus for selecting one term over the other. These two terms, plus HERD HOME RANGE, POPULATION/HABITAT UNIT, ELK MANAGEMENT UNIT, AND GAME MANAGEMENT UNIT, all attempt to define a specific area within which an analysis procedure can be performed. The first two are defined by animals (by radio locations), the remainder by people. The latter all seem to be arbitrary in the sense that they are drawn to contain a general area of elk habitat rather than a specific area defined by animals. Management units are most often used in management of hunting seasons. All terms should be used as defined. They are not interchangeable.

HABITAT CAPABILITY: The capacity of a given area to meet the needs of elk, either seasonally or year-round.

Discussion: Interestingly, this term is widely used and well-defined in the fisheries literature. The workshop participants considered it nearly equivalent to CARRYING CAPACITY and inapplicable to elk management. See ELK USE POTENTIAL for further discussion.

Recommendation: Should not be used unless used correctly.

HABITAT EFFECTIVENESS: Percentage of available habitat that is usable by elk outside the hunting season.

Discussion: HABITAT EFFECTIVENESS appears to have originated in the road density models as a means of expressing habitat loss associated with open forest roads. It has since been used to express habitat quality, hunting season SECURITY, HABITAT CAPABILITY, CARRYING CAPACITY, and several other conditions not justified by the available data.

Recommendation: We cannot just throw out all existing uses of the term, but biologists and managers should recognize that it has been widely abused. It is usually correct when applied to area. It is usually incorrect when substituted for SECURITY, capability, or productive capacity of habitats. Strive to limit applications to situations meeting the definition.

HABITAT USE POTENTIAL: See ELK USE POTENTIAL.

HERD HOME RANGE: The area a social group of ungulates traverses during normal activities.

Discussion: Although this is a viable concept, we rarely have enough information to use it. It usually includes the total range for a year. See HABIT ANALYSIS UNIT.

HIDING COVER:

Structural definition: Vegetation capable of hiding 90 percent of a standing adult elk from the view of a human at a distance equal to or less than 200 feet. As a site-specific vegetative component of SECURITY, the quality of HIDING COVER varies inversely with SIGHT DISTANCE.

Functional definition: HIDING COVER allows elk to use areas for bedding, foraging, thermal relief, wallowing, and other functions year-round. HIDING COVER may contribute to SECURITY at any time, but it does not necessarily provide SECURITY during the hunting season.

Discussion: Without question, the terms causing the greatest problems and the most confusion involved multiple interpretations and cross-referencing of HIDING COVER and SECURITY. The terms in this subject area often had several different meanings. The implications, particularly with regard to the hunting season, were extremely varied.

Recommendation: Workshop participants were unanimous in concluding that HIDING COVER is a requisite of elk habitat and a component of SECURITY. HIDING COVER alone does not provide SECURITY during the hunting season.

HUNTER OPPORTUNITY: An array of options that allows hunters to choose situations that are personally rewarding.

Discussion: Components of HUNTER OPPORTUNITY are influenced by human activities, hunting regulations, access, time and space, and land management activities. The key to this concept is the ability to select an option that is personally rewarding from several options. An important management decision in providing HUNTER OPPORTUNITY involves the scale of application: statewide, regionwide, forestwide.

KEY COMPONENTS: Areas or landscape features particularly important for maintaining the overall integrity of elk habitat.

Discussion: An acceptable term, other than the potential confusion with CRITICAL HABITAT.

MIGRATION CORRIDOR: Situations, usually linked to topography and vegetation, that provide a completely or partially suitable habitat that animals move through during migrations.

Discussion: This term is easy to misapply because it generally relates to specific locations and can be broadly or narrowly applied. The term usually describes a management problem rather than a definable component of habitat.

Recommendation: Be cautious in application. See TRANSITIONAL RANGE.

NURSERY AREAS: Areas used by a temporary elk social unit consisting of cows and young calves.

Discussion: It is not certain that the term has a specific meaning beyond normal early summer range for large elk cow/calf groups in relatively open habitat. See OBJECTIVES.

OBJECTIVES: The workshop participants identified six terms that are generally used correctly by biologists and managers although they have a high potential for misuse. SIGHT DISTANCE, BULL AGE DIVERSITY, NURSERY AREAS, CALVING AREAS, BEDDING AREA, and WINTER RANGE are seemingly unrelated, but they share a potential for misapplication in situations involving objectives other than protection of elk habitat.

Recommendation: Use these terms correctly in situations where they really are applicable.

OPEN ROAD EQUIVALENTS: A measure of access that addresses all types of roads and trails used by motorized vehicles, equating these to a common standard. Frequently used in the computation of HABITAT EFFECTIVENESS.

Discussion: Commonly, miles of secondary and primitive road are converted to equivalent primary road miles. Data are available to support such conversions. Various attempts have been made to extrapolate the concept to closed roads, to trails, and to roads and trails during the hunting season. There are no data to support such conversions.

Recommendation: Confine equivalent mileage conversions to evaluation of open roads and recognize that use by any motorized vehicle creates an open road.

OPEN VEGETATION: In habitat evaluation models, clearcuts, meadows, and other openings.

Discussion: The term may be useful in verbal discussions but probably defies written definition.

Recommendation: Clarity in descriptions is probably better served by actually saying "clearcuts" and "meadows." Do not use this term.

OPTIMAL COVER: A forest stand with four layers, an overstory that will intercept snow, and small openings that provide forage.

Discussion: Other than the clear similarity to old-growth, this was considered a vague term, difficult to measure and define.

Recommendation: Do not use this term.

POPULATION/HABITAT UNIT: A discrete association of individual elk bonded together by traditional use of a habitat.

Discussion: By definition, this appears to be identical to HERD HOME RANGE. In use, the unit is usually smaller, indicating some seasonal use by a group of elk. We rarely have enough information to use this concept, but it can be extremely useful when data are available. See HABITAT ANALYSIS UNIT.

Recommendation: Use when data are available.

POTENTIAL ELK USE: See ELK USE POTENTIAL.

ROAD INFLUENCE: The effect a road has on elk distribution, behavior, and vulnerability to hunters.

Discussion: This is sometimes interpreted as a zone of influence and is often associated with calculations involving HABITAT EFFECTIVENESS.

Recommendation: Use only as justified by existing literature and within the context of existing habitat models.

SECURITY: The protection inherent in any situation that allows elk to remain in a defined area despite an increase in stress or disturbance associated with the hunting season or other human activities.

Discussion: SECURITY is a state of being or a condition. The workshop group agreed that SECURITY is a functional concept most important when viewed in relation to the hunting season. The components of SECURITY may include, but are not limited to, vegetation, topography, areal extent, road density, distance from roads, size of vegetation blocks, hunter density, season timing, and land ownership.

Recommendation: Very little problem can be encountered in the use of this term if it recognized that HIDING COVER is site specific, while SECURITY is area specific.

SECURITY AREA: Any area that will hold elk during periods of stress because of geography, topography, vegetation, or a combination of those features.

Discussion: SECURITY AREA is the structural constituent of SECURITY. The workshop group considered this term more meaningful than SECURITY HABITAT. The consensus opinion was that SECURITY HABITAT, even if used as a synonym, can only add confusion and should be avoided.

SECURITY COVER: The vegetative cover component of SECURITY.

Discussion: The literature review for this term demonstrates a tendency to equate SECURITY AREA and SECURITY COVER. Although the definition is fairly clear, the consensus of the workshop was that SECURITY AREA is entirely adequate.

Recommendation: Do not use this term.

SECURITY HABITAT: See discussion for SECURITY AREA.

Recommendation: Do not use this term.

SIGHT DISTANCE: The distance at which 90 percent or more of an adult elk is hidden from human view.

Discussion: A measure of the effectiveness of HIDING COVER, but not a measure of SECURITY. See OBJECTIVES.

THERMAL COVER:

Structural definition: For elk a stand of coniferous trees 40 feet tall or taller with average crown closure of 70 percent or more. In some cases, topography or vegetation less than specified may meet animal needs for thermal regulation.

Functional definition: Situations, usually related to vegetation structure, used by animals to ameliorate effects of weather.

Discussion: THERMAL COVER, as much as any other term discussed at the workshop, seems to have developed cadres of adherents and of detractors. One reviewer suggested the substitution of “overstory cover” as a replacement. Discussion also noted that thermal relief can be supplied by topography, other animals, and different combinations of vegetation, water, and air movement.

Recommendation: Acceptable concept but should not be used loosely.

TRANSITIONAL RANGE: Areas where elk concentrate during spring and/or fall. TRANSITIONAL RANGES are generally adjacent to WINTER RANGE and may provide important SECURITY during the fall.

Discussion: TRANSITIONAL RANGE may be important for SECURITY. “Transitional” should not be confused with “transitory.” Nearly all MIGRATION CORRIDORS are better described as TRANSITIONAL RANGE.

Recommendation: Use this term rather than MIGRATION CORRIDOR in most cases.

TRANSITORY RANGE: Rangeland created to increase forage production for livestock.

Discussion: This term is sometimes substituted for TRANSITIONAL RANGE. It is not the same thing.

Recommendation: Term should be avoided in any discussion of elk management because it applies directly to livestock.

WINTER RANGE: The area, usually at lower elevations, used by elk during the winter months. See OBJECTIVES.

Lyon, L. Jack; Christensen, Alan G. 1992. A partial glossary of elk management terms. Gen. Tech. Rep. INT-288. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 6 p.

This glossary helps define terms that have been misused during forest planning. Terms that were developed from research on the influences of timber sales and roads during the summer months have been used inappropriately when referring to winter range, hunting seasons, and other conditions. The glossary is based on the results of an "Elk Management Terminology Workshop" held at the University of Montana's Lubrecht Experimental Forest on April 3-4, 1990.

KEYWORDS: terminology, forest planning, elk security, elk vulnerability



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